

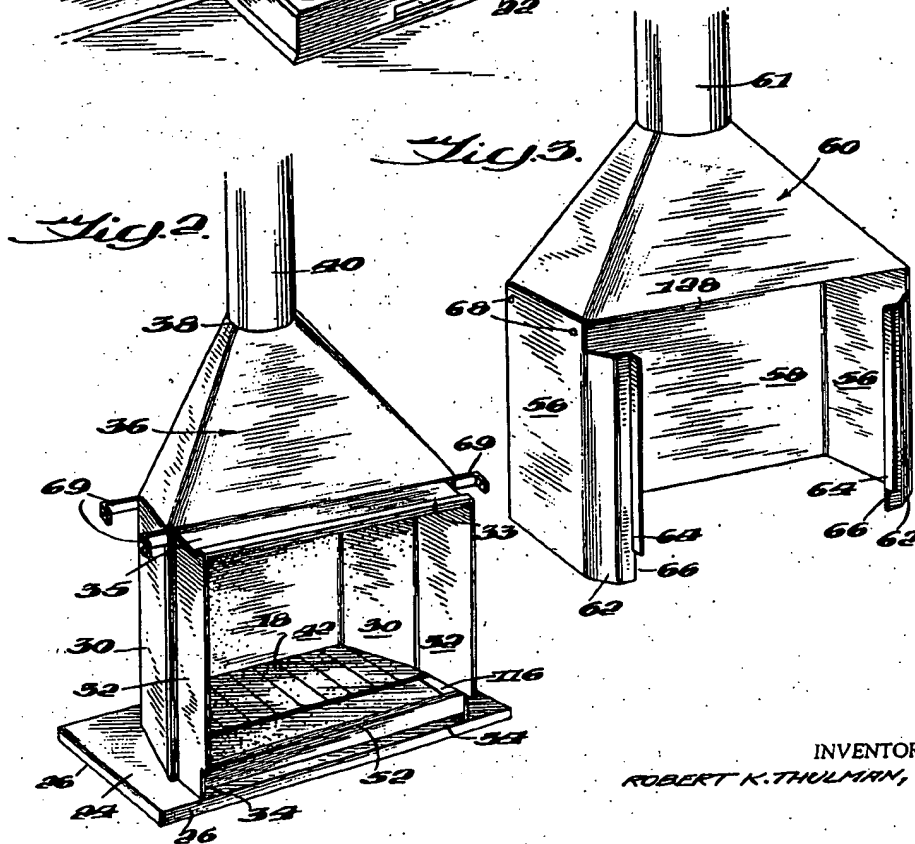
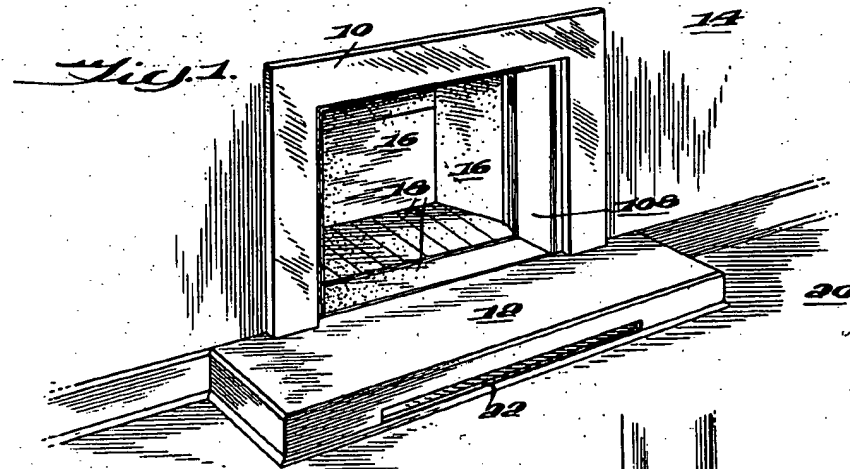
Feb. 4, 1958

R. K. THULMAN  
FIREPLACE CONSTRUCTION

2,821,975

Filed Dec. 31, 1954

6 Sheets-Sheet 1



INVENTOR  
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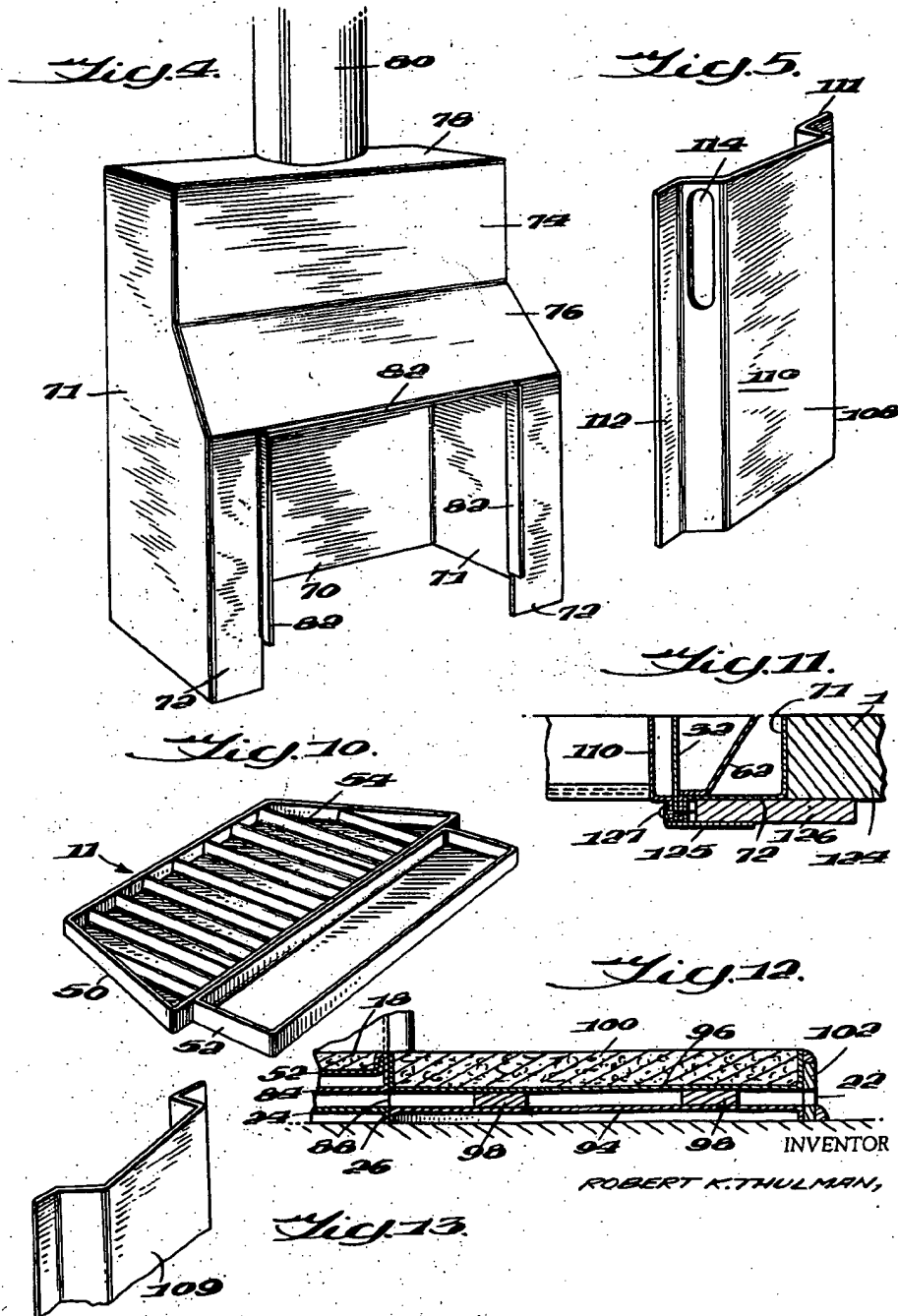
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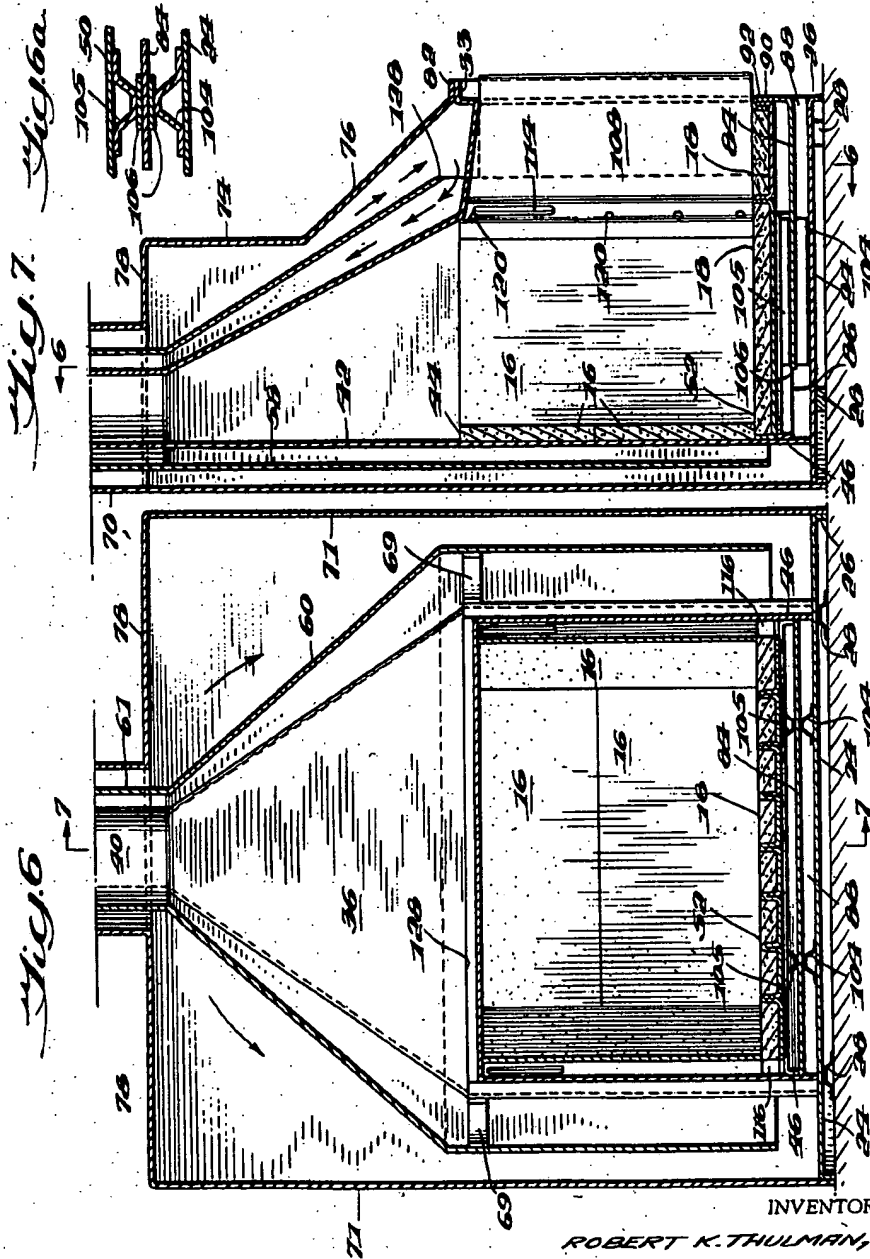
R. K. THULMAN

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FIREPLACE CONSTRUCTION

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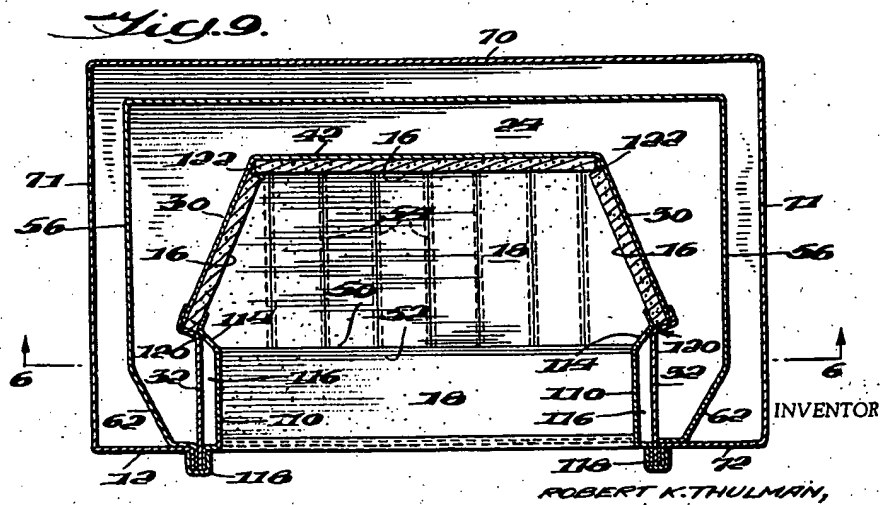
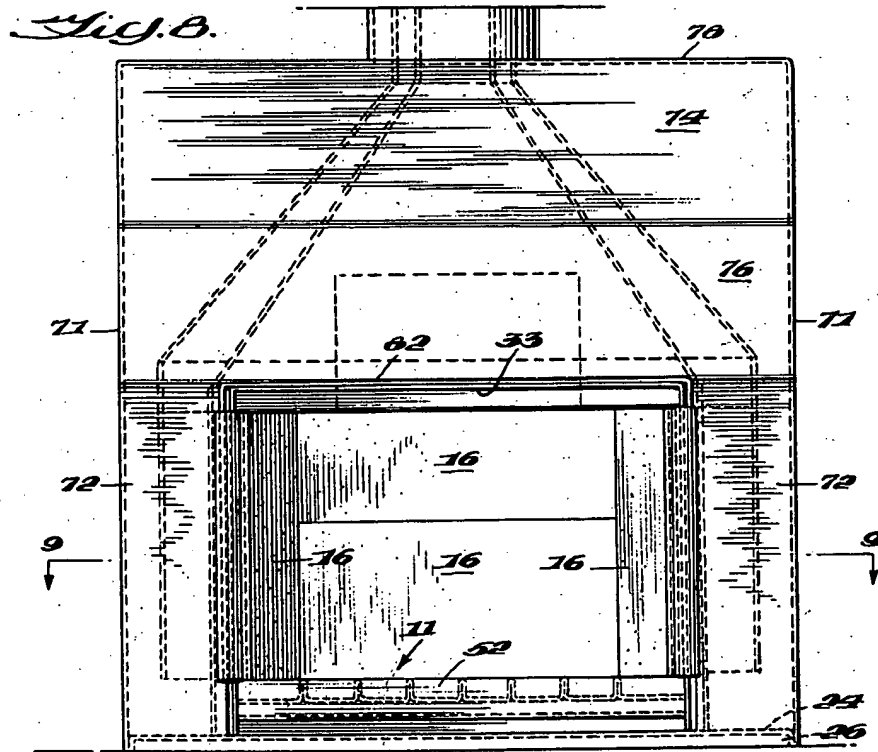
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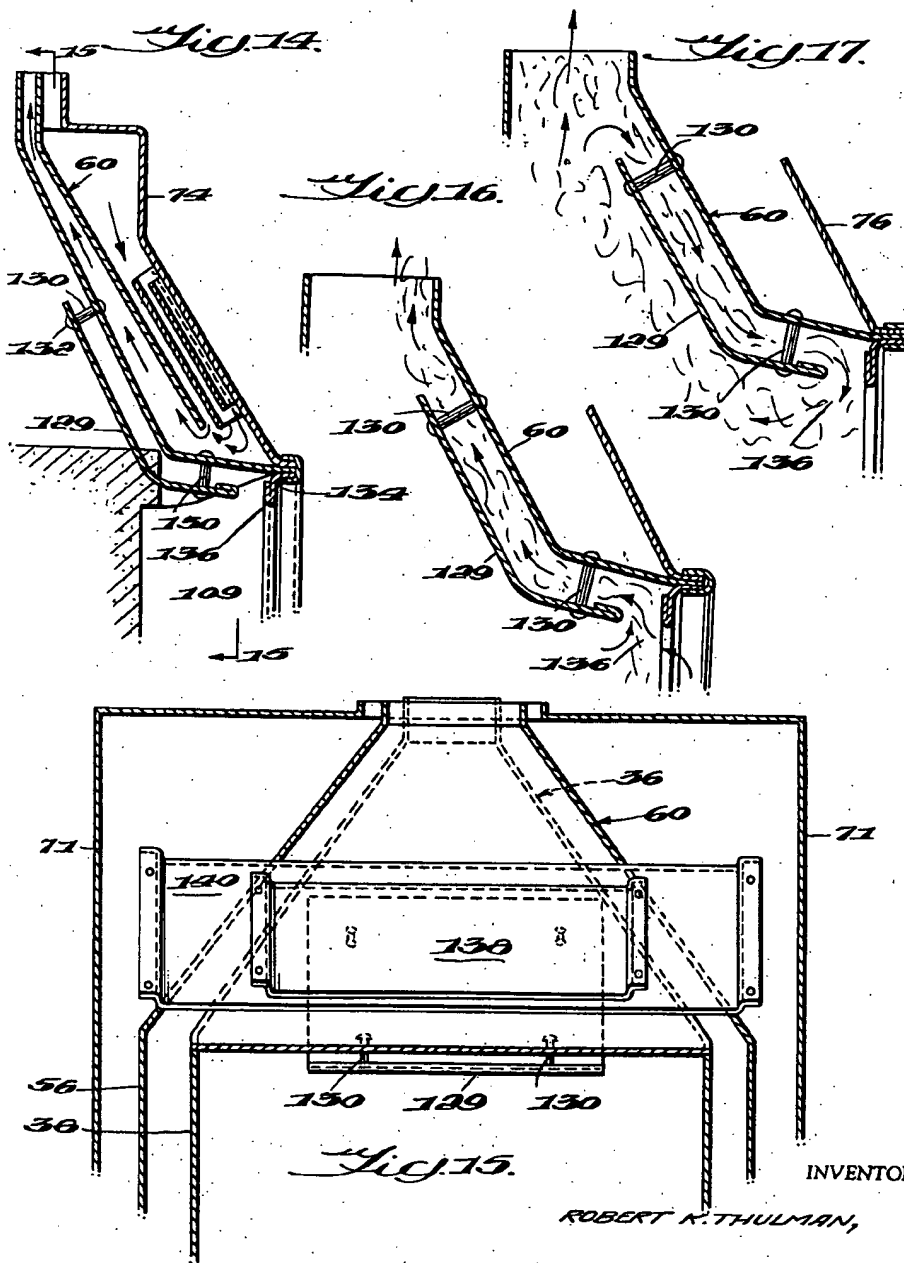
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FIREPLACE CONSTRUCTION

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R. K. THULMAN

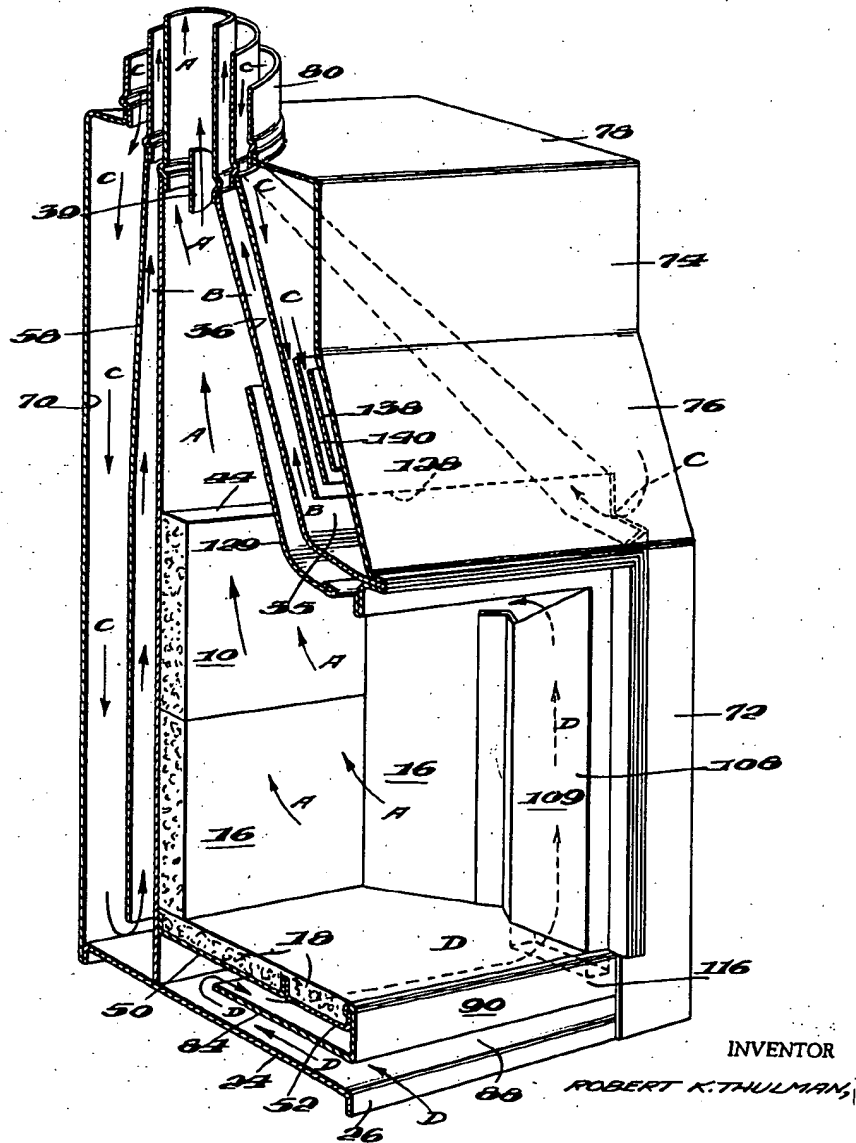
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FIREPLACE CONSTRUCTION

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6 Sheets-Sheet 6

*Fig. 10.*



2,821,975

## FIREPLACE CONSTRUCTION

Robert K. Thulman, Silver Spring, Md.

Application December 31, 1954, Serial No. 479,131

11 Claims. (Cl. 126—120)

This invention relates to the art of fireplace construction and more particularly to a fireplace which may be factory built and installed as a unit at a home site without the services of skilled artisans. The invention is intended primarily for use in one and two story dwellings for the burning of fuels ordinarily used, such as wood, coke, charcoal and coal.

Among the objects of the invention are the provision of a fireplace which is safe, which stores little heat, unlike the massive masonry fireplaces of the prior art, which is non-smoking, light weight, economical, and pleasing in appearance. The fireplace of the present invention heats up quickly and produces a draft with only a small amount of heat. It is quick cooling, thereby reducing the flow of air from the house up the chimney and reducing the long periods of heat loss which accompany the use of conventional masonry fireplaces. The fireplace flue may be completely separate from the central heating plant flue, thereby obviating erratic behavior of the latter due to external heating, as is the case where both the heating plant flue and the fireplace flue are enclosed in the same masonry chimney. The invention requires little space and is unrestricted in its location in the dwelling. It may be employed with its own chimney, but, if desired, the fireplace chimney and the central heating plant chimney may terminate in a single top housing.

A primary object of the invention is to provide a fireplace which does not cause auxiliary convection heating, as is the case with circulating fireplaces, and which thus does not upset the balance of the central heating system. In conventional installations, heat circulated from the fireplace may actuate the thermostatic control of the central heating system, thereby preventing the latter from operating and allowing rooms remote from the fireplace to cool to an undesirable degree. The heat output of the invention to the adjoining room is principally by radiation.

The fireplace of the present invention may be employed most conveniently in conjunction with the chimney construction described and claimed in my prior Patent No. 2,634,720, issued on April 14, 1953. In that patent, a chimney construction is described which utilizes thermo-syphonic principles to control both the lateral and longitudinal heat gradient. The fireplace of the present invention also employs thermo-syphonic movement of air to maintain safe temperatures on the surface of the outer casing of the fireplace unit. A plurality of thermo-syphonic paths are provided. All of the basic construction may be of metal, and the prevention of excessive temperatures on those surfaces in contact with combustible construction adjoining the fireplace may be ensured principally by thermal circulation of air and partially by the use of reflective surfaces. The fireplace and flue may be installed with zero clearance to combustible construction. The fireplace is a free standing assembly which also supports its flue and may be installed on and adjacent to wood frame construction. Hearth extensions of the flush, stepped, or raised cantilever type may be em-

ployed, and a variety of face treatments with and without mantels may be provided.

In general the fireplace of the present invention may be formed as a single assembly comprising three basic elements. The fire box or fireplace proper may be a steel box lined with refractory surmounted by a pyramidal smoke chamber terminating in a circular outlet to which the smoke-flue of my aforesaid prior patent may be connected. The front sides and back of the fireplace may be welded or otherwise secured to a steel base plate. An inner liner or casing of light gauge metal and of substantially the same general shape as the fire box may be supported by welded steel brackets and spaced away from the fireplace and away from the base plate. The pyramidal section of the inner liner may terminate in a circular opening spaced away from the flue gas conduit outlet so as to form an annular opening. The inner duct of the chimney of my aforesaid patent may be connected to this opening. A rectangular outer casing may surround the entire assembly of the fireplace and may be attached to the base plate. In the top of the outer casing is a circular opening, which forms a second annulus with the opening in the inner casing. To this opening the outer duct of my chimney may be attached. Steel angle sections may be welded to the three sides of the combustion chamber slightly above the bottom edges to support a steel hearth section. The two front corners of the hearth section may be cut out so as to provide a pair of openings between the sides of the combustion chamber and the edges of the hearth. Between the hearth and the base plate a baffle of aluminum or other suitable reflective material may be employed to divide the space under the hearth. This baffle, at its back edge, may be shorter than the hearth so that the space between the base plate and the baffle communicates with the space between the baffle and the under side of the hearth. A vertical extension of the baffle closes the front of the upper of these two spaces. Two vertical steel side flues or risers, which may be open at their tops, connect with the two openings at the sides of the fire box.

The foregoing and other objects of the invention will become more apparent in the following detailed description of illustrative embodiments of the invention taken in conjunction with the accompanying drawings wherein:

Figure 1 is a general perspective view of a fireplace construction fully installed and ornamented in a typical manner;

Figure 2 is a perspective view of the fire box thereof mounted on the base plate and provided with refractory lined hearth and interior surfaces;

Figure 3 is a perspective view of the inner casing thereof;

Figure 4 is a perspective view of the outer casing thereof;

Figure 5 is a perspective view of an embodiment of a steel riser employable therein;

Figure 6 is an offset front sectional view taken along line 6—6 in Figure 7 and illustrating the assembled fireplace;

Figure 6a is a detail of Figure 6 on an enlarged scale; Figure 7 is a side sectional view taken along line 7—7 in Figure 6;

Figure 8 is a front elevation view of the assembled fireplace;

Figure 9 is a plan sectional view taken along line 9—9 in Figure 8;

Figure 10 is a perspective view of one form of hearth (unlined) that may be employed in the construction;

Figure 11 is a modified sectional detail illustrating a typical manner of installing the fireplace in conjunction with an ornamental surround;

Figure 12 is a modified sectional detail illustrating the manner of employing an ornamental hearth extension in conjunction with the fireplace;

Figure 13 is a perspective view of an alternative form of riser which may be employed instead of that illustrated in Figure 5;

Figure 14 is a sectional view of an alternative construction employing a smoke scoop, additional baffles and a slightly modified construction;

Figure 15 is a front sectional view taken along line 15-15 in Figure 14 and further illustrating the alternative construction of that figure;

Figure 16 is an illustrative diagram indicating the operation of the smoke scoop under certain circumstances;

Figure 17 is another illustrative diagram indicating the operation of the smoke scoop under other circumstances; and

Figure 18 is a broken away perspective view of the assembly of Figures 14-17 illustrating the plurality of gas flow paths.

Referring to Figure 1 of the drawing, a typical installation of the fireplace of the invention may include an ornamental surround or facing 10 of suitable material, for example marble or ceramic tile, a hearth 11, and a hearth extension 12 which may be formed of similar material. The rear face and the sloping side faces of the fire box may be lined with refractory blocks 16, and the hearth may be filled with a castable ceramic material as indicated at 18. The overall appearance of the assembled fireplace unit may be quite close to the appearance of conventional masonry installations. The front opening of the fire box may be substantially flush with an interior wall 14, while the bottom surface of the fire box may be raised above or flush with the floor surface 20 as desired. The exact manner of installation is subject to innumerable variations. It will be noted that a slot 22 is formed in the front surface of the hearth extension, and the purpose of this slot will become more apparent hereinafter.

The general appearance of the fire box unit prior to assembly and installation is shown in Figure 2. The fireplace is supported on a base plate 24, which may be a sheet of steel with turned down edges 26. Support legs may be spot welded to the bottom surface of the base plate at strategic points as indicated at 28 in Figures 6 and 7 to support the weight of the fireplace.

Still referring to Figure 2, the general shape of the fire box may be substantially like that of a conventional fireplace. Its sides 30 may be tapered toward the rear and provided with straight side extensions 32 having notches 34 at their lower front corners to accommodate hearth extension 12. The side and back surfaces of the fire box may be lined with ceramic blocks as indicated above so as to retain heat in the fire chamber to provide a lag in cooling when the fire dies down. A pyramidal flue communicating or smoke box section 36 extends above the fire chamber and terminates in a generally circular outlet 38 to accommodate a flue 40. The flue opening may be controlled by a suitable damper 39 (Figure 18). In practice, the top of the pyramidal section may terminate in a circular coupling, and the smoke flue of the prefabricated chimney described in my aforesaid patent may be connected thereto or supported thereon at the installation site. The back of the fire chamber extends straight upward as shown at 42 in Figure 7, and the ceramic blocks 16 terminate at the beginning of the pyramidal section as seen at 44 in that figure so as to act as a vestigial smoke shelf. The flue chamber has a top extension 35 which closes with extensions 32 and is provided with a lip 33.

The hearth, more clearly illustrated in Figure 10, may be formed of light gauge steel and is supported on a plurality of steel angles 46 welded to the rear and sides of the fire box as illustrated in Figures 6 and 7. The bottom of the hearth is thus raised above the surface of

the base plate. As seen in Figure 10 the hearth 11 may comprise a rear section 50 having tapered sides to complement the sides of the fire box and a front section 52 of slightly less width so as to form spaces 116 with side extensions 32, as shown in Figures 2 and 6. The rear portion 50 of the hearth may be formed from a single folded steel sheet (as shown in Figure 6), or may be formed from a flat steel sheet provided with a plurality of dividers 54 which may be steel angle stock secured as by welding to the bottom surface of the hearth (see Figure 10). As indicated above, the sections of the hearth may be filled with a castable ceramic material 18.

The inner casing, illustrated in Figure 3, comprises a rectangular bottom portion having side walls 56 and rear wall 58, and an upper pyramidal portion generally designated 60. The top of the pyramidal portion terminates in a circular opening to receive the inner duct or casing 61 of the chimney above mentioned. In practice the top of the pyramidal portion may be provided with a circular coupling section, and the inner duct or casing of the chimney may be connected thereto or supported thereon at the site of installation. The sides 56 of the bottom portion are provided with a pair of forwardly converging extensions 62, the front edges of which are formed with a pair of angular flanges 64. The forwardly extending lips of these flanges may be notched at 66 so as to complement the notches 34 of the fire box illustrated in Figure 2. The inner casing is provided with a plurality of screw holes 68 on each side. These holes receive bolts or sheet metal screws which serve to support the inner casing on brackets 69 secured, preferably by welding to the sides of the fire box (see Figure 2). When the inner casing is mounted on the fire box brackets, it is spaced from the fire box and raised above the base plate 24 as illustrated in Figures 6 and 7.

The outer casing, illustrated in Figure 4, comprises rear wall 70, side walls 71, vertical front walls 72 and 74, rearwardly sloping front wall 76, and a top wall 78. The top is provided with a circular opening to receive the outer duct or casing 80 of the chimney. As set forth with respect to the fire box and inner casing, a circular coupling section 81 (Figure 18) may be provided and the outer duct or casing of the chimney may be connected thereto or supported thereon at the site of installation. The frontal opening of the outer casing is provided with an outwardly directed lip 82, the side portions of which complement the forwardly extending lips of flanges 64 of the inner casing (Figure 3), and the top portion of which complements lip 33 formed on the extension 35 of the fire box (Figure 2). The outer casing is designed to fit about the downwardly turned lips 26 of the base plate as seen in Figures 6 and 7, and may be welded or otherwise secured thereto and when assembled the edges of the frontal opening in the outer casing close with the corresponding edges of the fire box, which together with the hearth, define the access opening of the fireplace.

The "piano box" shape of the outer casing 68 is particularly advantageous. Frame partitions have a thickness of approximately five inches. Thus the set back of the casing immediately above the fireplace opening allows the framing around the fireplace opening to be held down to a reasonable height and minimizes the area necessary to be covered by the surround 10 (Figure 1). As shown in Figures 6, 6a, and 7, the space beneath the hearth and above the base plate is divided into two parts by a horizontal baffle 84 having a depth less than the depth of the hearth and the fire box so as to leave an opening 86 along its rear edge (see Figure 7) for communication between the space above and below the baffle. The front edges of the baffle and the base plate together with the front edges of the fire box define a rectangular opening 88 below the front of the hearth. The opening which would normally exist between the bottom of the hearth and the baffle is closed by an upwardly turned lip



90 on the front edge of the baffle, which may have a U shaped flange interlocking with the front edge of the hearth as indicated at 92 in Figure 7.

When a hearth extension such as extension 12 in Figure 1 is employed, the slot 22 therein is arranged to communicate with opening 88 below the baffle in Figure 7. Figure 12 illustrates the use of one such hearth extension, which may comprise a metal base plate 94, an upturned metal pan 96 supported on the base plate by suitable spacers 98 and filled with a ceramic material 100. The hearth extension may be provided with ornamental facing material as indicated at 102.

Baffle 84 may be separated from base plate 24 by a plurality of spacer elements 104 and from the hearth by a plurality of spacer elements 105. The spacer elements are strategically arranged between the adjoining surfaces so as to support the weight of the fireplace and transmit this weight to the base plate. In practice the spacer elements may be constituted by U-shaped metal brackets spot welded to the under side of the hearth and the upper side of the base plate and insulated from baffle 84 by strips of asbestos tape 106 attached thereto in any suitable manner, preferably by cementing or stapling to the aluminum baffle 84.

The sides of the fireplace opening as seen in Figure 1 are constituted by a pair of vertical risers 108, that are exposed to the radiant heat of the fire and induce flow of cooling air under the hearth. Two exemplary embodiments are illustrated, one in Figure 5, and a second in Figures 13 and 14. In the form of Figure 5 the risers are preferably formed of stainless steel and have side surfaces 110, forward flanges 111 and rearward flanges 112. The risers are provided with outlet means, shown in Figure 5 as slots 114 in their rearward flanges. The vertical risers are assembled against the inner surfaces of extensions 32 (Fig. 2) so as to form side flues communicating with the space above baffle 84 (Figures 6 and 7) through the spaces 116 formed between the ends of the forward hearth portion 52 (Fig. 10) and the side extensions 32 of the fire box. The assembly of the risers with the fire box may be clearly seen in Figure 9. As shown in this figure, the forward flanges of the risers complement the forward flanges of the inner and outer casings as well as the forward extensions of the fire box, all of which may be secured together by U-shaped clamping strips 118 and metal screws or rivets (not shown). The rearward flanges of the risers together with the side walls 30 define rearwardly facing channels that serve to embrace the front edges of and retain the side fire block linings 16 in the fire box, and may be fixed to the extensions 32 of the fire box at 120 by metal screws. The side ceramic fire blocks 16 in turn may retain the rear fire blocks by engaging their edges as at 122. In the preferred form, all four of the ceramic blocks are interchangeable, and if one is broken, as by throwing a heavy log against it, replacement is simply made by prying out the rear edges of the side blocks, replacing the broken blocks, reseating the front edges of the side blocks, and swinging the side blocks back into position.

Figure 11 illustrates an alternative scheme for securing forward edges of the risers, fire box, and casings and at the same time affixing an ornamental surround of glass, marble, tile, or other suitable material. In this figure the outer casing sidewall 71 is shown butted against a framing member 124, and the edges of the fire box, etc. are covered by an ornamental L shaped plate 125 and secured together and to the surround 126 by a pin or stud 127.

Figure 18 embodies some modifications yet to be described, but illustrates the plurality of air paths formed by the assembly of the fireplace elements previously described. In operation, flue gases from fuel burning on the hearth pass upward through the flue as indicated by arrows A. Heat from the flue is transferred to the air in the inner duct causing this air to rise as indicated

by arrows B and be displaced by air descending from the outer duct of the chimney and passing through the fireplace casings as indicated by arrows C. The latter air passes downward through the outer casing of the fireplace along the rear and side walls thereof and passes under the lower edges of the inner casing and upward through the inner duct between the fire box and the inner casing (arrows B). Air also passes down the outer duct between the frontal surfaces of the inner and outer casings and passes under the frontal edge of the inner casing at 128 (see also Figure 7). This air then passes up the inner duct and out the chimney. Some air also passes down the outer duct, across the top extension 35 of the fire box and up the inner duct as indicated by arrows C'. The movement of air is thermosiphonic and is accelerated during heavy firing periods, thereby keeping the outer surface of the fireplace unit cool, so that combustible material in contact with or adjacent to the fireplace is not endangered.

Another air path, indicated by arrows D, begins at opening 88 near the floor, continues in the space between the base plate and the lower surface of the baffle, around the rear edge of the baffle, into the space between the lower surface of the hearth and the upper surface of the baffle, spreading transversely to openings 116, and then upward through the side flues formed by the vertical risers 108, into the fire box and up the central flue. Radiant heat from the fire heats the vertical risers, causing the air in them to rise and be displaced by air from the frontal opening 88. This air, at room temperature, removes heat from the under side of the hearth and serves to prevent excessive temperatures on the floor under the fireplace. It will be noted that the riser structure 109 in Figure 18 differs slightly from that illustrated at 108 in Figure 5 in that the upper edge of the riser slopes downwardly and rearwardly to form the outlet means into the smoke chamber, thereby eliminating the need for slots 114 (Figure 5). This construction is illustrated in more detail in Figure 13.

Figure 14 illustrates a slightly different embodiment of the fireplace construction, including a smoke scoop 129 having a generally rectangular outline but which, in the form shown, is bent to complement the under surface of the upper frontal portion of the fire box. The smoke scoop may be suspended from the fire box by a plurality of brackets or spacers 130 secured to the inner surface of the fire box and to which the smoke scoop is secured in any suitable manner, as indicated at 132. The smoke scoop terminates slightly rearward of the frontal edge of the fire box and together with a depending lip 134 defines a slot 136 just within the fire box opening. Lip 134, which may be constituted by a trim strip, may be welded or otherwise secured to the corresponding lips of the fire box and outer casing. The trim and side flues are all replaceable elements. The trim strip in front of the smoke scoop can be replaced by a deeper one to regulate the size of the fireplace opening, or may be provided with a support for a draw-type screen if desired. The recessed front of the fireplace opening is adapted to receive a fire screen of the portable, portable folding type, or permanent hung curtain type.

The operation of the smoke scoop is illustrated in Figures 16 and 17. Under low draft conditions, smoke which might tend to diffuse into the room adjacent the fireplace opening is prevented from doing so as indicated in Figure 16 by air moving upward between the smoke scoop and the fire box upper wall. The air in the space thus defined is heated by radiant heat from the fire box impinging on the smoke scoop 129, and rises upward into the central flue of the chimney, being displaced by cool air from the room moving into the slot 136 and carrying with it smoke at the frontal opening of the fireplace. Under heavy smoking conditions, as shown in Figure 17, the air flow in the smoke scoop may actually

be reversed. Under such conditions, however, the smoke is drawn back into the smoke chamber by the draft on the fire box side of the warmed smoke scoop, and is prevented from diffusing into the room. By intercepting radiant heat, the smoke scoop also reduces radiant heating of the frontal surfaces of the fireplace.

The embodiment of Figure 14 is also provided with a pair of auxiliary baffles 138, 140 more clearly illustrated in Figure 15. These baffles may assume generally rectangular forms and be secured underneath the sloping frontal surface 76 of the outer casing by flanges 142. Baffle 138 may have substantially less depth than baffle 140 and be nested within the latter. These baffles serve to reduce even further the heating of the frontal surface of the outer casing by providing additional air blankets and radiant heat interception between the outer casing and the fire box as well as additional reflective surfaces.

The fireplace of the present invention has been tested and approved by Underwriters Laboratories, Inc., as set forth in its Miscellaneous Hazard Report No. 6618, July 14, 1954, a copy of which is attached and incorporated herein by reference. Constructional dimensions and details are found in this report, as well as test procedures and results. The latter establish that the fireplace described will withstand extreme overfiring and yet maintain the temperature of the outer casing well within safe limits.

Preferred forms of the invention have been described herein more or less precisely as to details. It is to be understood, however, that the invention is not to be considered as limited thereby, that changes may be made in the arrangements and proportions of parts, and that equivalents may be substituted without departing from the spirit and scope of the invention. It will be clear to those skilled in the art that the manner of shaping and assembling the various parts and the choice of materials may be subject to many variations. The primary parts may be formed of aluminized steel of suitable gauge, advantage being taken of its reflective properties to reduce even further heat transfer to the outer casing, and the components may be assembled through the use of spot welds, S-lock strips, sheet metal screws, or other appropriate means. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of equivalency of the claims are intended to be included therein.

I claim as my invention:

1. A fireplace or the like for use in conjunction with a chimney having a flue and cold and warm air ducts, comprising a fire box having a lateral fireplace opening and an upper flue opening adapted to communicate with said chimney flue; an inner casing surrounding said fire box and spaced therefrom to define an inner duct, an outer casing surrounding said inner casing and spaced therefrom to define an outer duct, said inner and outer ducts communicating adjacent their lower extremities and having duct openings adapted to communicate with said warm air and cold air chimney ducts, respectively, whereby heat radiated from said fire box causes a thermosiphonic counterflow of air through said ducts so as to control the cooling of the exterior surfaces of said fireplace, said fire box having a hearth, means defining an air duct beneath said hearth, the last mentioned duct having an entrance aperture separate from said fire box and having an exit aperture adapted to communicate with said chimney, whereby heat from said fire box causes a thermosiphonic flow of air through said duct to cool said hearth; the last mentioned means comprising a base plate beneath and spaced from said hearth, a baffle between said hearth and said base plate and forming therewith interconnected lower and upper spaces, and at least one vertical riser adjacent a wall of said fire box and forming therewith a vertical duct communicating with said upper space and the interior of said fire box.

2. A fireplace or the like comprising a base plate, a fire box mounted on said base plate and having a lower combustible-receiving portion and an upper flue communicating portion, said lower portion having a pair of side walls and a rear wall, a hearth mounted in said fire box above and spaced from said base plate, said hearth having side and rear extremities complementing said walls, respectively, a portion of said side extremities being separated from said side walls so as to define a pair of openings, a pair of vertical risers extending above said openings, respectively, and forming with said side walls a pair of flues communicating with the space between said hearth and said base plate, said flues communicating with the interior of said fire box at points on said risers above said hearth, and a baffle between and spaced from said hearth and said base plate, said baffle terminating short of the rear wall of said fire box and having a portion extending upward to said hearth at the front of said fire box so as to form a duct commencing at the front of said fire box, folded back upon itself, and communicating with said flues above said baffle.

3. A fireplace or the like according to claim 2, further including baffle supporting means between said base plate and said baffle and between said baffle and said hearth, said supporting means comprising interposed heat insulating material.

4. A fireplace or the like according to claim 3, said baffle being of heat reflective material.

5. A fireplace or the like comprising a base plate, a fire box mounted on said base plate and having a lower combustible-receiving portion and an upper flue communicating portion, said lower portion having side walls and a rear wall and a frontal opening, said upper portion having side walls and a rear wall extending from the corresponding walls of the lower portion to a flue opening at the top of said upper portion and having a front wall extending from the top of said access opening to said flue opening, an inner casing around said fire box and spaced therefrom at the rear, sides, and front to define an inner duct adapted to communicate at its upper extremity with a corresponding chimney duct, said inner casing having upper and lower portions complementing the respective portions of the fire box, an outer casing enclosing said inner casing and spaced therefrom at the rear, sides, and front to define an outer duct adapted to communicate at its upper extremity with a corresponding chimney duct, said outer casing having upper and lower portions complementing the respective portions of said inner casing, communication being provided between the inner and outer fireplace ducts near the lower extremity of the rear and sides of the inner casing, said inner and outer casings having frontal openings complementing the frontal opening of said fire box, the side edges of the frontal openings of at least said fire box and outer casing meeting, and the top edges of the fire box and outer casing frontal openings meeting, communication being provided between the inner and outer ducts adjacent the top edge of the inner casing frontal opening, and a hearth in said fire box forming the lower boundary of said frontal openings.

6. A fireplace or the like in accordance with claim 5, further including a smoke scoop comprising a wall mounted on the inner surface of the front wall of said fire box and spaced therefrom, said scoop extending from the vicinity of said access opening upwardly toward said flue opening.

7. A fireplace or the like in accordance with claim 5, further including at least one baffle mounted in the space between the front walls of the upper portions of said inner and outer casings spaced from the last mentioned walls, whereby heating of the front wall of the outer casing by the fire in said fire box is reduced.

8. A fireplace or the like in accordance with claim 5, the major portion of the side edges of the frontal opening in said inner casing being constituted by side extensions

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having an upper terminus spaced below the top edge of the last mentioned frontal opening, said fire box having corresponding side extensions meeting the first mentioned side extensions.

9. A fireplace or the like in accordance with claim 5, said fire box having a hearth adjacent the bottom thereof, said hearth and at least part of the interior surfaces of the lower portion of said fire box being lined with refractory material, the material lining the rear wall of said fire box having an upper edge constituting a smoke shelf.

10. A fireplace installation comprising in combination, a prefabricated fireplace unit and a prefabricated chimney unit; said fireplace unit having a fire box surrounded by inner and outer casings each mutually spaced from the others at rear, front, and sides to define inner and outer ducts around the fire box, said fire box having a frontal opening and said outer casing having edges closing with the edges of the fire box at the top and sides of said frontal opening, said inner casing being formed to provide communication between said inner and outer ducts at the rear and sides of the fireplace unit adjacent the bottom of the unit and at the front of the fireplace unit adjacent the top of said frontal opening, said fireplace unit further comprising a central vertical smoke outlet extending upwardly from said fire box, an annular air outlet concentric with said smoke outlet and communicating with said inner duct, and an annular air inlet concentric and surrounding said air outlet and communicating with said outer duct; said chimney unit comprising a central smoke flue fitting said central smoke outlet,

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and inner and outer air ducts open at their tops and fitting said annular air outlet and annular air inlet, respectively, whereby, on operation of the fireplace, a thermo-syphonic air circulation is induced in heat exchange relation with the fire box of the fireplace unit and the smoke flue of the chimney unit.

11. A fireplace installation according to claim 10, said fire box supporting the smoke flue of the chimney unit, said inner casing supporting the inner duct of said chimney unit, and said outer casing supporting the outer duct of said chimney unit, whereby the chimney load is divided between the said fireplace elements.

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